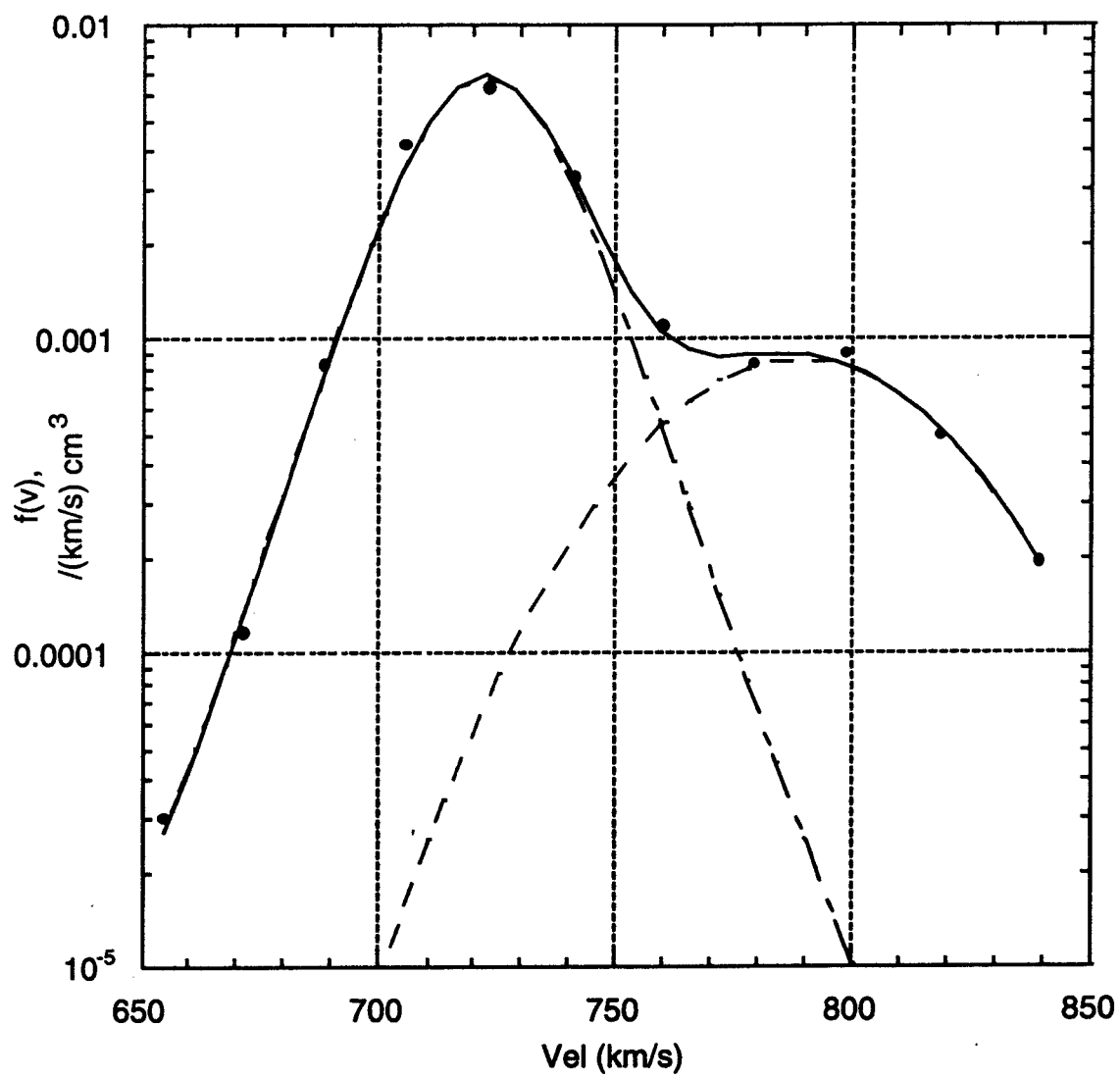


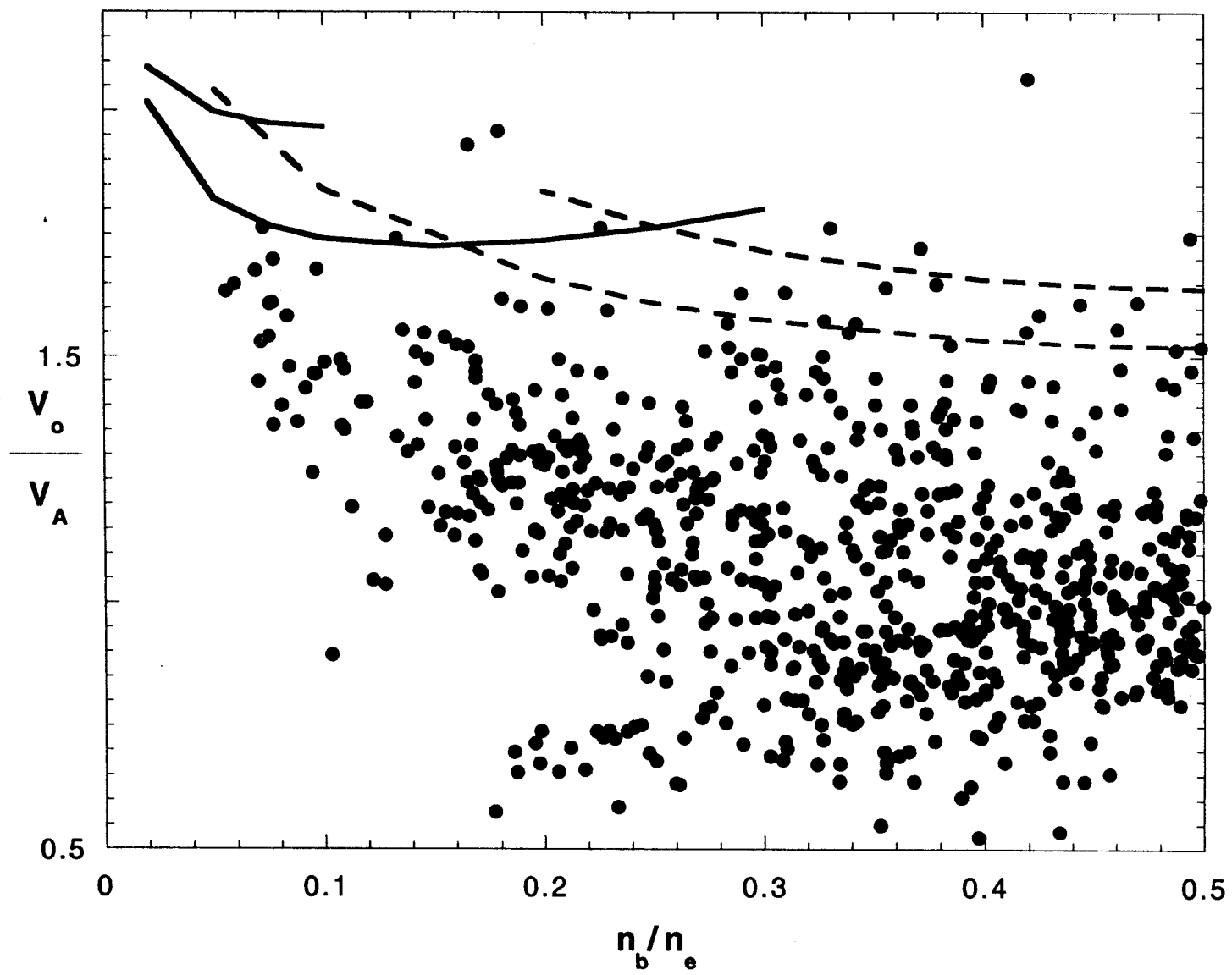
# **Properties of Multiple Proton Beams in the Solar Wind**

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Technical Associates, Inc., S. P. Gary/LANL, D.  
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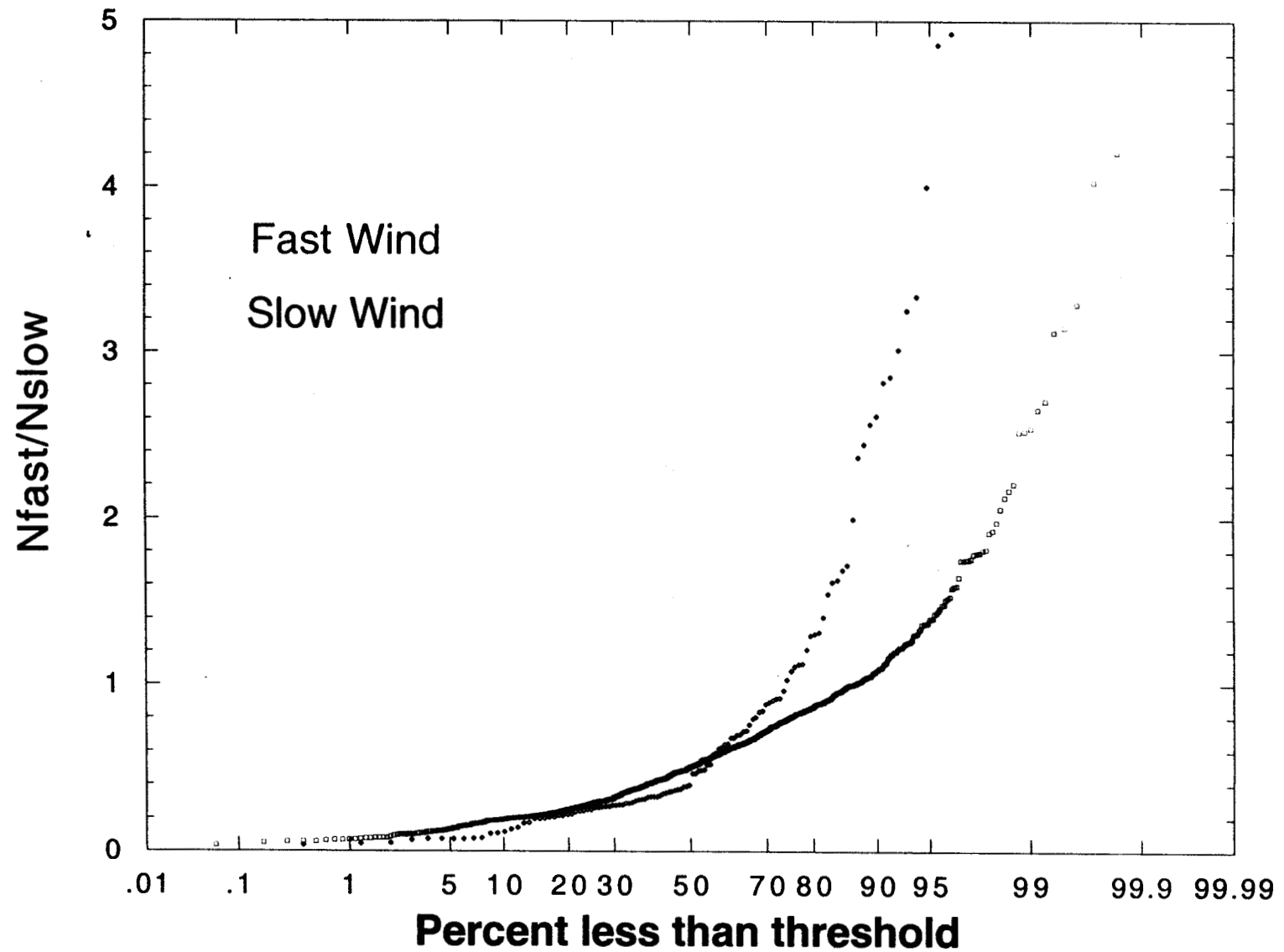
## **Observations and Method**

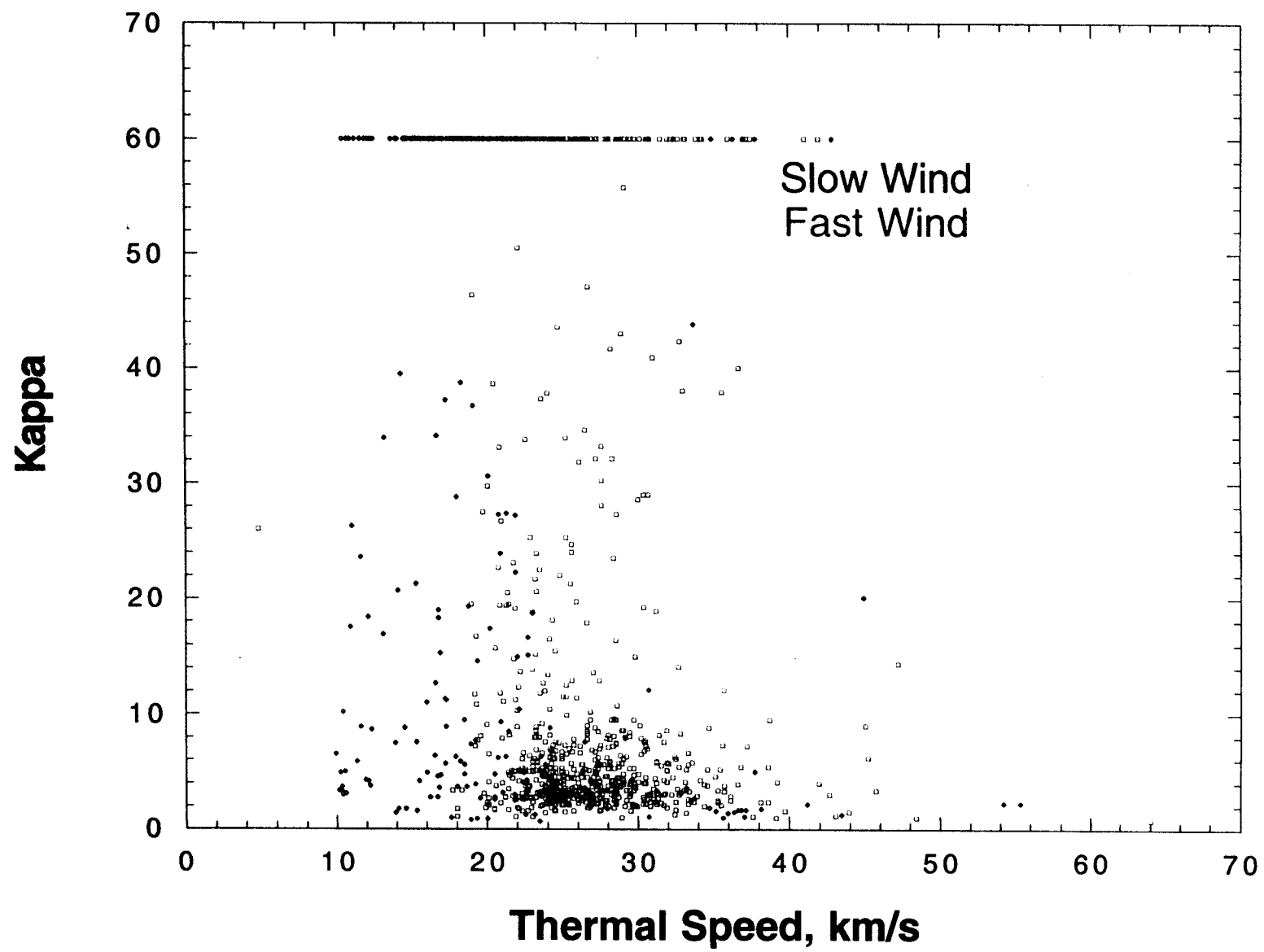
- **SWOOPS/Ulysses plasma data is used within 3.0 AU of the Sun; this is the outbound in-ecliptic in 1990-91, and the fast latitude scan during 1994-95**
- **Observations of 2 proton beams can only be obtained with good resolution when the magnetic field is approximately radial; 1D velocity space distributions are obtained.**
- **Data are fit to a 2 beam model with the slower beam described by a Kappa function and the faster beam by a Maxwell-Boltzmann distribution.**
- **For the period of the fast latitude scan, the data has been characterized by whether or not the magnetic field is in the direction of the dominant polarity**



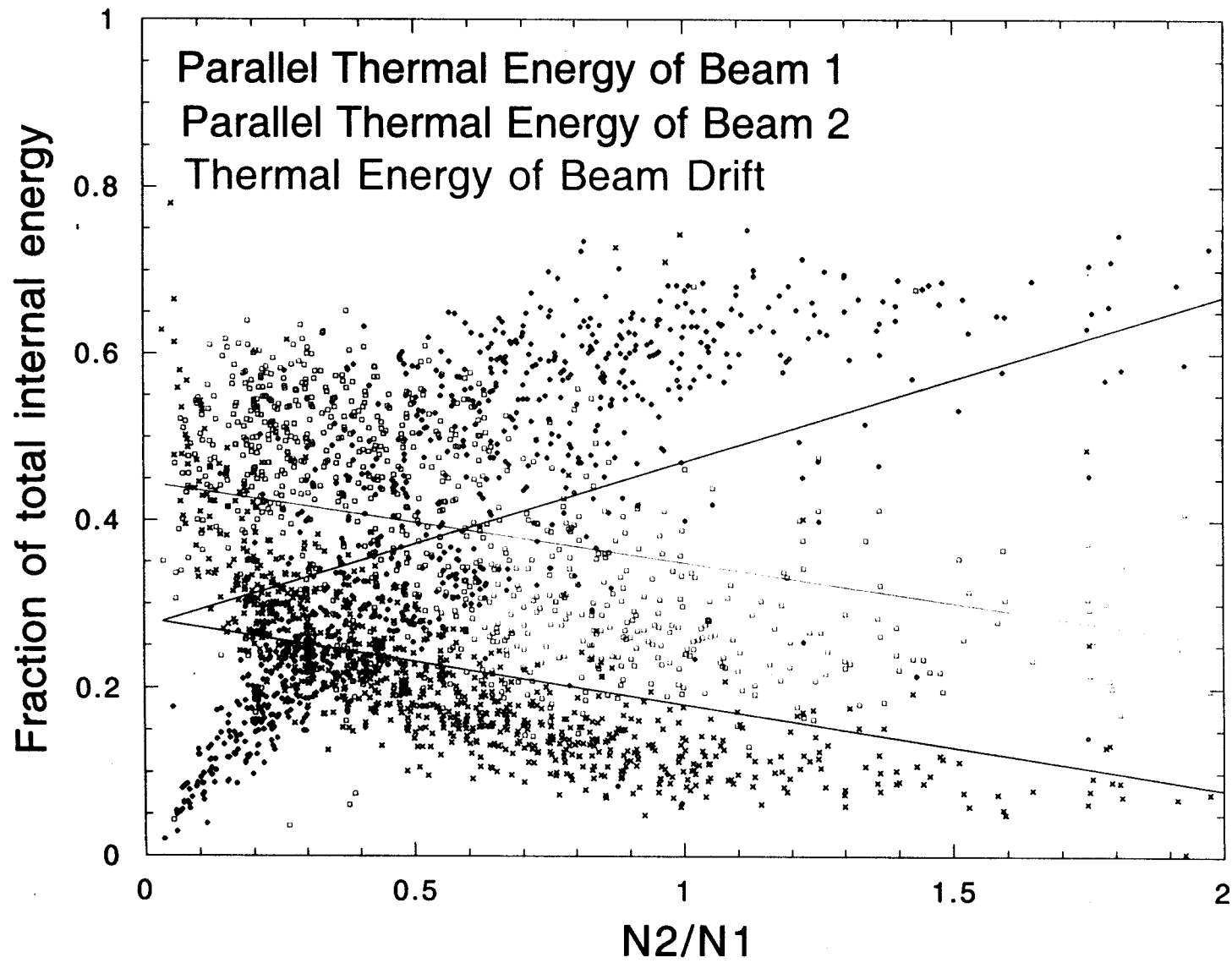


# Ratio of faster beam density to slower beam density

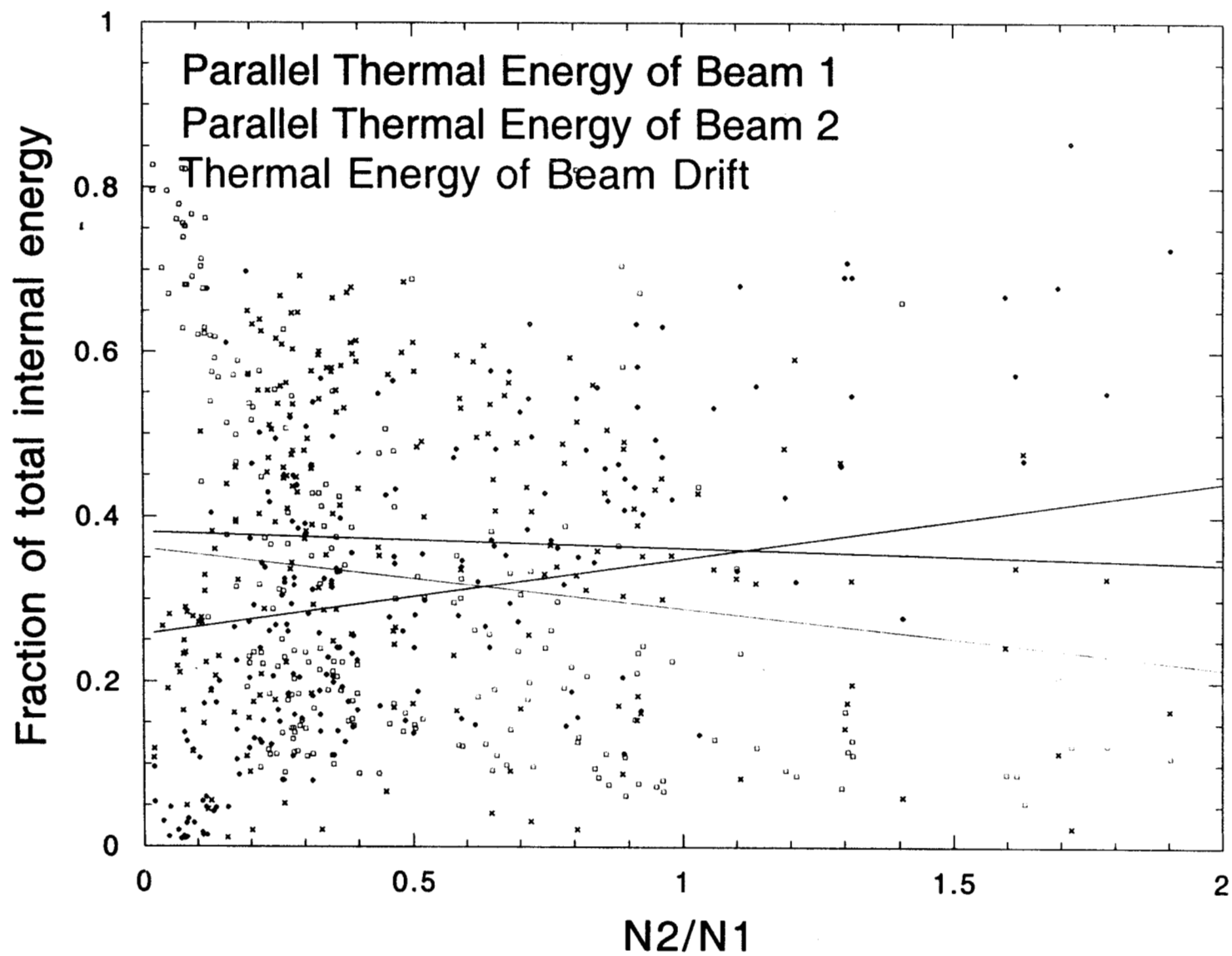




## Fast Wind



## Slow Wind





# Summary

- **Almost all high speed solar wind is well fit by a two beam model. For the slow solar wind, 229 of 351 cases were well fit.**
- **The fraction of energy carried by beam drift does not depend noticeably on whether the wind is fast or slow**
- **The faster beam has more thermal energy than the slower beam in the high speed wind.**
- **The faster beam and slower beam have approximately equal thermal energies in the slow solar wind.**
- **For the density ratio of fast beam to slow beam, the averages:medians of the slow wind are 0.74:0.37 and of the fast wind are 0.63:0.51.**